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DEPARTMENT OF COMMERCE
BUREAU OF FISHERIES

GENERAL REPORT OF OPERATIONS IN BRISTOL BAY DURING THE FALL OF 1923

During the fall of 1923 the work of exterminating predatory fish was continued at Aleknagik Lake after the departure of the regular summer crew, August 3 until October 1. In conjunction with this work an examination was made of the TikChik Lake System where the spawning grounds were inspected and a map made of that region. J. Paulsean, Master of the Bureau's patrol boat Scoter, who has been detailed with the writer to remain in Bristol Bay for the fall and winter, was in charge of the work at Aleknagik Lake while the writer was making the trip to the TikChik. A report of our work is herewith respectfully submitted.

At the close of the commercial fishing season in Bristol Bay the Bureau's various crews were transported to points of departure for the trip to the States. All patrol boats and equipment used during the summer and no longer needed were stored for the winter. Two men were engaged for the fall work, L. Akelkok and A. Nelson, both residents of this section. McGill, Engineer of the Scoter, MacLernon, Naknek Patrolman and Anderson, Nushagak Patrolman, who were awaiting the mail steamer Starr for passage to the States, were taken to Aleknagik Lake where they served with the crew working on predatory fish until August 16.

OPERATIONS AT ALEKNAGIK LAKE

Although members of the fall crew were working at Aleknagik Lake along with the summer crew prior to the summer crew's departure on August 3, that date is given as the day that fall operations began. This is done to keep clear the tally of predatory fish destroyed, the summer crew having reported fish destroyed up to and including August 2, while in this report the tally begins with August 5.

From August 3, until August 16, operations centered in the vicinity of the main inlet of the river entering Aleknagik Lake from Nerka Lake. A bunk scow anchored in the eddy formed by the river entering the lake served as living quarters for the crew. Fishing for trout was carried on with set gill nets, drift gill nets, seine, handlines and bait-traps. Gill nets were set out and picked mornings and evenings. Drifts were made with a gill net in the early mornings and evenings. Trout were baited up to favorable locations for seining, with the bodies of trout

destroyed and hauls made with a seine. Late evenings proved to be the best time for this work. During the days fishing was carried on with hand lines from the scow. A bait-trap was constructed, baited with salmon eggs and tried out in several locations. Fair results were accomplished with all gear excepting the bait-trap, until August 16.

On August 10, the floating trap which had been constructed during the summer was towed to the outlet of the lake and a crew of 3 men detailed to install it. The trap began fishing on August 14, but the catches were small. Gill nets were set out in the vicinity of the outlet of the lake and work continued on the trap. The length of the, "lead" was increased and the position of the trap in relation with the current shifted several times with no better results. Meanwhile set gill nets in the vicinity of the outlet of the lake were proving effective.

On August 16 operations at the upper end of the lake were discontinued and all gill nets concentrated at the outlet. Work with the trap was continued but results remained poor, the trap's best take for one day being 32 trout. Fair catches with the gill nets were made at the outlet of the lake until August 26.

Operations were moved up lake again on August 27, to the inlet of the river entering Aleknagik Lake from Nerka Lake. Gill nets were set out in the vicinity and the work of installing the floating trap started. The trap was set near the eddy formed by the river entering the lake and was in condition for fishing August 31. Results from the trap were poor and when a storm on September 2 displaced the trap from its moorings, it was decided not to reset it. The trap was taken out of the water and stored for the winter. During this time fair work was being done with gill nets and good catches made with the seine. Gill nets set out at the mouth of Stormy Creek at the extreme head of the lake yielded good catches for a time. Fishing with handlines was carried on but results from this method were poor. On September 10, began a period of very heavy rain and the water of the lake raised rapidly. A guage at the camp showed a raise of the lake water of 74 inches from noon September 11, to noon September 14. With the rise of the water, catches of trout fell off to almost nothing.

On September 17, operations were moved to the outlet of the lake. Gill nets were set out and a fike net installed in the eddy at the outlet so as to catch incoming trout. Set nets were operated at Bear Bay on the west shore of the lake to which daily trips were made from the camp at the outlet. Results were for the most part, poor, due to the extreme height of the lake water. During the later part of September, the weather turned cold and an early "freeze up," threatened. Nets were picked up and dried and the bunk scow moved to winter moorings. All work at the lake was completed and the crew departed from there October 1.

The total number of predatory fish destroyed at Aleknagik Lake during the fall was 2,389. Ninety-five per cent of these were Dolly Varden, the remainder consisting of Pike and Rainbow Trout.

While carrying on the work of exterminating predatory fish during the fall a careful examination was made of all the spawning areas of Aleknagik Lake and an estimate made of the number of red salmon that spawned there. Trips were made up all of the lake's tributary streams and the entire shore line was examined. A total of 7,500 red salmon spawned in five of the lake's nine main tributaries. Salmon did not enter the other tributaries. It was estimated that 9,000 red salmon spawned along lake shore areas, or a total of 16,500 red salmon spawned in Aleknagik Lake and its tributaries, approximately fifty per cent less than last year.

During the fall an examination was made of the TikChik Lake System where the spawning grounds were inspected and a map made of that region showing the lakes and their tributaries, connecting rivers and the drainage system into Bristol Bay. This work was carried on in conjunction with operations at Aleknagik Lake, where J. Paulsean, assumed charge while the writer was making the trip to the TikChik.

Before starting the examination of the TikChik Lake System, prospectors and natives residing in Bristol Bay were questioned regarding the district to be visited and it was found that practically nothing is known of the TikChik beyond that it is a region of numerous large lakes. Most maps of this section of Alaska show one or more lakes known as the TikChik Lakes lying to the north of the Wood River lake System and drained to the Nushagak River by the TikChik River. In preparing this report and map the native nomenclature as applied to the main features by natives residing in the TikChik, is used. We are indebted to Mr. F. A. Waskey, who is very familiar with the Innuait language, for the proper spelling of names, and for information regarding some of the upper features of the district. Mr. Waskey is prospecting in the district.

The TikChik Lake System lies directly to the north of the Wood River Lake System and constitutes the main lake source of the Nushagak River. It consists of 6 lakes, namely Chi-koom-i-nuk, Chauis-kuk-tuli, Nish-lik, Up-pnuk, First Nu-ya-kuk, and Second Nu-ya-kuk. It is drained to the southeast by the Nu-ya-kuk River for a distance of about 60 miles meander into the Nushagak River which in turn drains into Nushagak Bay and Bristol Bay. The Nu-ya-kuk River enters the Nushagak River about 148 miles above the village of Snag Point which is situated at the point where the Nushagak River widens into Nushagak Bay. The TikChik District derives its name from the TikChik River, a small tributary stream that drains Nish-lik and Up-pnuk, the smallest of the TikChik lakes, into the First Nu-ya-kuk Lake.

Leaving Snag Point August 25, our party proceeded up the Nushagak River to the mouth of the Nu-ya-kuk River, thence up that river to the first Nu-ya-kuk, Second Nu-ya-kuk, and Chauis-kuk-tuli lakes, Patrol boat, "no. 4", was used for the run up the Nushagak and Nu-ya-kuk rivers as far as the First Rapid on the Nu-ya-kuk River 198 miles above Snag Point. An 18 foot cod fish dory equipped with an evinrude engine was used for the trip up the Nu-ya-kuk above the First Rapid and for the work on the lakes. The three main TikChik Lakes namely First Nu-ya-kuk, Second Nu-ya-kuk and Chauis-kuk-tuli were circled and their entire shore line examined. Trips were made to ascertain the relative position of and to secure information regarding the three lesser TikChik lakes Chi-koom-i-nuk tributary to Chauis-kuk-tuli and Nish-lik and Up-pnuk tributary to the First Nu-ya-kuk Lake. To ascend to these lakes by their connecting rivers would require several weeks of travel which time could not well be spared owing to the proximity of the "freeze up." As salmon do not enter the stream connecting Chi-koom-i-nuk Lake with Chauis-kuk-tuli Lake and reliable information was at hand regarding Nish-lik and Up-pnuk from Mr. F. A. Waskey who had just descended their connecting river, little was to be gained by a visit to these lakes and it was decided to spend all available time on the examination of the main lakes. Our work was completed and Snag Point reached September 17.

NUSHAGAK RIVER

In traveling to and returning from the TikChik District that portion of the Nushagak River from its mouth at Snag Point to the entrance of the Nu-ya-kuk River came under our observation and was sketched from the compass and its main channel included in our map. From the inlet of the Nu-ya-kuk River the general trend of the Nushagak River is Southeast for a distance of 45 miles, then south for a distance of 68 miles and then west to Snag Point where it widens into Nushagak Bay, an arm of Bristol Bay. This portion of the river flows through a country of low rolling hills well timbered with spruce, birch and cottonwood. The river in places breaks up into many channels. The tides from Bristol Bay effect the river for a distance of 35 miles above Snag Point. The current is fairly swift and it takes a good launch to make headway up stream. Our actual running time from Snag Point to the mouth of the Nu-ya-kuk River was 49 hours with patrol boat, "No. 4." Two large tributaries enter the Nushagak below the Nu-ya-kuk River. Kok-wok River enters on the west shore 80 miles above Snag Point and the Mul-chat-na River enters on the east shore 115 miles above Snag Point. There are 6 native villages on the Nushagak River all of which were visited to question the natives regarding the run of salmon and the extent of their catch. These villages evidently had at one time a large population but they are nearly deserted now.

Kok-wok Village is located on the west shore of the Nushagak River near the mouth of the Kok-wok River 80 miles above Snag Point. It was at one time a large village, but only two families of natives were living there at the time of our visit. They were deer herders and were not fishing. They report having seen several hundred red salmon ascending the Kok-wok River during the last days of July.

Ek-wok Village is on the west shore of the Nushagak River 85 miles above Snag Point. This is at the present time the largest native village on the Nushagak River. Seven native families were living at Ek-wok- all of whom were

fishing. About 7,000 salmon were caught at this place during the summer most of which were dried for winter use. It was estimated that a little over 1,000 of the catch consisted of red salmon, the remainder of chum, king and silver salmon. The natives reported that the red salmon run was extremely light this season (1923) and that most of the red salmon passed Ek-wok during the last days of July.

Unn-uk-bak Village is on the west shore of the Nushagak River 15 miles above Ek-wok Village and 100 miles above Snag Point. Here was one native family. These natives were fishing with 2 traps, constructed of split spruce strips, shaped much like a fike net. With these traps they had taken about 800 salmon of which about 150 were red salmon. They had taken tagged red salmon, No. 6743 on the last day in July.

Eli-la-kok Village on the east shore of the Nushagak River 103 miles above Snag Point was deserted.

A-gok-pak Village is on the west shore of the Nushagak River 113 miles above Snag Point. Here were three native families who had taken roughly, 2,000 salmon, about 400 of which were red salmon.

Ko-lig-a-nek Village is on the west shore of the Nushagak River near the mouth of the Nu-ya-kuk River 148 miles above Snag Point. This is the furthest up river native village and evidently at one time had a large population. Here we found two native families. They had been fishing during the summer and caught about 300 salmon, about fifty per cent of which were red salmon.

NU-YA-KUK RIVER

The Nu-ya-kuk River is the largest tributary of the Nushagak River in the amount of water discharged. It drains the waters of the TikChik Lake System for a distance of 60 miles to the Nushagak River. From its upper end at the outlet of the First Nu-ya-kuk Lake to its junction with the Nushagak River, the general trend is southeast. For the first 10 miles the river flows through a mountainous country which breaks away abruptly to a country of low rolling hills well timbered with spruce and birch. The river has three rapids all of which are in the upper reaches.

The first rapid is 10 miles below the outlet at the First Nu-ya-kuk Lake. The rapid is one-third mile long and the river breaks into three channels. Small boats can be lined up the right hand channel. Salmon ascend easily.

The second rapid is five miles above the first rapid. Here the river falls fully 75 feet in a distance of one-eighth mile. Boats must be portaged in traveling either up or down river. The portage is on the west shore and is 300 yards long with a rise of 100 feet going up river ~~and 25 feet going down river~~. A windlass was used to portage our dory. Salmon ascend through a series of eddies.

The third rapid is at the outlet of the First Nu-ya-kuk Lake. It is

one-half mile in length. Small boats can be lined up along the south shore. Salmon ascend easily.

There are no native villages on the Nu-ya-kuk River and only one tributary stream of importance enters the river. Two native families were camping for the fishing season at the mouth of this tributary. They caught during the summer, roughly 1,000 salmon, a large proportion of which were red salmon. These natives had no name for the tributary stream so it was called camp creek.

Camp Creek enters the left limit of the Nu-ya-kuk River at the foot of the third rapid. It has its source in a series of small ponds to the north and is about 10 miles in length, has an average width of about 10 feet and an average depth of two feet. Red, king and silver salmon ascend the stream to spawn. It was estimated that 1,000 red salmon spawned in the stream and ponds.

TIKCHIK-LAKES

The TikChik Lakes consist of a chain of three main lakes and three lesser tributary lakes. The main lakes are closely united and are, in order of ascending, First Nu-ya-kuk, Second Nu-ya-kuk and Chavis-kuk-tuli. The other lakes are Nish-lik and Up-pnuk, tributary to First Nu-ya-kuk, and Chi-koom-i-nuk tributary to Chavis-kuk-tuli. The character of the country surrounding the lakes is extremely mountainous. Most of the tributary streams that enter the lakes are small, of short length and too swift for salmon to ascend and consequently of little interest from a fishery standpoint.

FIRST NU-YA-KUK LAKE

The First Nu-ya-kuk Lake is the first of the TikChik lakes and the smallest of the 3 main lakes. It is triangular in shape with a length of nine miles and a maximum width of 7 miles. From the outlet to the inlet the direction is Southwest. Excepting at the upper end the lake is shallow and its bottom strewn with large boulders. The greater part of the lake's shore-line is rocky and unsuitable for spawning. The entire shore-line was examined, and a few red salmon sighted, about 25 in all, but no red salmon were found spawning. The lake has two large tributary streams.

Creek No. 1 enters on the south shore of the lake near the inlet from Second Nu-ya-kuk Lake. About two miles of its lower reach was examined. The stream has an average width of 20 feet and depth of two feet for the first two miles. The current is fairly swift and the bottom gravelly. No traces of salmon were found. The stream's source is apparently mountainous.

TikChik River enters the First Nu-ya-kuk Lake on the north shore about six miles above the outlet. The river at its mouth has a width of about 100 feet and an average depth of two feet. No salmon were seen in the mouth of the river and vicinity (Sept., 6). Natives reported that in former years immense runs of red salmon passed up this stream to the two lakes above. Time would not permit a trip to these lakes. Mr. F. A. Waskey, who descended the river during the time of our examination, furnished us with a sketch of the river and its lake source, Nish-lik and Up-pnuk lakes. Mr. Waskey reported having sighted roughly, 75 salmon during his trip down the river.

SECOND NU-YA-KUK LAKE.

The Second Nu-ya-kuk Lake is the next lake above First Nu-ya-kuk Lake to which it is connected by what might best be termed a strait about two miles in length and one-fourth mile in width. The water of the strait is very deep and its current barely perceptible.

Second Nu-ya-kuk Lake is elongated in shape with a length of 19 miles and an average width of four miles. From the outlet to the inlet from the lake above the direction is W.N.W. and the distance four and one-half mile, the main portion of the lake lying south of the inlet and outlet. The character of the country surrounding the lake is mountainous and, excepting at the northern end, high mountains rise abruptly from the lake's edge. Most of the lake's shore-line is rough and strewn with large boulders, but along the north shore from the inlet to the outlet, an estimated distance of 10 miles, the lake has good gravel bottom well suited for spawning. About 100 red salmon were sighted along this section of the lake, all of which were highly colored but none were found working at nests. No salmon were found in the other parts of the lake. The lake, particularly the southern portion, receives many small tributary streams which descend the mountain sides in cataracts and in many cases may be seen in their entire length from the lakes. They have no interest from a fishery standpoint as fish cannot ascend them.

Creek No. 2 enters the lake about one mile north of the inlet of the river from Chavis-kuk-tuli Lake. It was examined for a distance of one mile above its mouth. For the first mile the stream has an average width of 10 feet and depth of one foot. It has a good gravel bottom and the current is slow, about three miles per hour. No salmon were found in this stream.

CHAVIS-KUK-TULI LAKE

Chavis-kuk-tuli- Lake is the third of the three main TikChik lakes and the largest of the group. It is 21 miles in length, has an average width of four miles and from its outlet to the head the direction is Southwest. It lies north of, and a little to the west of the Second Nu-ya-kuk Lake to which it is connected by a river one mile in length with an average width of 150 feet and depth of two feet. Upon leaving Chavis-kuk-tuli Lake the river flows due east, is fairly swift and in ascending the river, boats must be lined from the banks. Thirty-five red salmon were counted in the river while we were ascending (Sept., 8) all of which were apparently ascending. None were sighted during our return trip (Sept., 11). Chavis-kuk-tuli Lake like the first and second Nu-ya-kuk lies among lofty mountains. Of its shore-line, about 13 miles of its northern shore, from a point directly opposite the outlet of the lake Southwest to the mouth of Creek No. 5, is an almost continual gravel beach. Along this shore were practically all of the red salmon that we found in our examination of the TikChik Lakes. They were found at intervals all along this shore and several groups of 50 or more were seen. In some places work on nests was in progress (Sept., 7 to Sept., 11). The lake along the Northeast shore has a mud bottom. No salmon were found there. Only a few salmon were sighted along the southern shore of the lake, about 50 in all. Chavis-kuk-tuli Lake has three large tributaries in none of which salmon were found.

Creek No. 3 enters the Northeast end of the lake. For the first mile the stream has an average width of 15 feet and depth of three feet. Its current is hardly perceptible and the bottom mud covered. The stream's origin

is in the marshy land lying Northeast of the lake practically the only lowland bordering the lake.

Creek No. 4 is a swift mountain stream that enters the lake on its north shore five miles west of the outlet of the lake. It has an average width of 25 feet and depth of two feet at its mouth. It was examined for a distance of about two miles above its mouth by land. This stream cannot be ascended by a boat. Salmon cannot ascend it. Mr. F. A. Waskey who made the trip up this stream by land during the summer furnished us with a sketch of the stream and its lake source Chi-koom-i-nuk Lake.

Creek No. 5 enters the lake on the north shore 13 miles Southwest of the outlet of the lake. In its lower reach this stream has an average width of 10 feet and depth of two feet. It has good gravel bottom apparently well suited for spawning purposes. It was examined for a distance of about two miles above its mouth, but no salmon were found.

EXTENT OF RED SALMON RUN TO TIKCHIK LAKES

The TikChik Lakes, as the main lake source of the Nushagak River, are the logical destination of the greater part of the red salmon that pass up the Nushagak River to spawn. Natives residing on the upper Nushagak River report, "That red salmon pass up the Kok-wok River (tributary of the Nushagak) which drains a series of small lakes and also up the Nu-ya-kuk River to the TikChik Lakes." "That the run of red salmon up the Nu-ya-kuk River is much larger than the run up the Kok-wok and that red salmon are never found in any other tributaries of the Nushagak River." Salmon upon leaving Salt water in Bristol Bay, to reach the first of the TikChik lakes, must ascend roughly 210 miles of river and negotiate three rapids none of which are difficult. Of the run of red salmon that passed up the Nushagak River in 1923, roughly, 2,000 were caught by 13 native families that live along the river. All of these were caught above the mouth of the Kok-wok River, and it is fairly certain that all of these were bound for the TikChik Lakes. The gear that these natives operated (gill nets and traps, most of which the writer inspected) did not have the capacity to catch a large proportion of a salmon run passing up the river. In our examination of the spawning grounds of the TikChik Lakes we found, an estimated number of 4,000 red salmon, 3,000 of which were spawning along lake shore areas on the north shore of Chauis-kuk-tuli Lake, the remainder in a tributary stream that enters the Nu-ya-kuk River near the outlet from First Nu-ya-kuk Lake. There was evidence of a run of at least some red salmon up the TikChik River to Nish-lik and Up-pnuk lakes. No other tributaries were ascended by salmon.

OTHER FISH IN THE TIKCHIK DISTRICT

Natives living in the TikChik District (three families live there, none of which have ever been to Bristol Bay) report red, silver, king, chum and humpback salmon enter the lakes and that humpback salmon never ascended the Nu-ya-kuk River above the 22nd. rapid previous to the season of 1920, when an extensive alteration occurred in this rapid during the spring break-up. During our examination of the district we noticed a few king salmon

in the upper reach of the Nu-ya-kuk, but none were found in the lakes. Several hundred silver salmon and a few humpback were sighted in the lower part of First Nu-ya-kuk Lake but none were found in the upper lakes. No chum salmon were seen during our examination of the lakes.

According to a story common among the natives of Bristol Bay, "The TikChik is the home of a great fish known as the Chi-eg-i-nuk which is said to become so large and vicious as to attack and destroy caribou and other animals that attempt to cross the river and lakes and that the natives in the TikChik never use brightly painted Koyoks for fear that they will attract these fish." Upon reaching the TikChik District we found the story true as far as the painting of the Koyoks is concerned and that the natives are in fear of these fish. Our excitement became high when one of the natives volunteered to catch us a small Chi-eg-i-nuk (none of them have ever seen one of the large ones) and our disappointment was deep next morning when the native paddled up to our camp and with the word "Chi-eg-i-nuk," tossed a fine specimen of lake trout (Christivomer namaycush) on the beach. We found great numbers of lake trout in all parts of the lakes during our examination of the lakes and the natives reported that each fall shortly before the freeze-up a great run of these fish occurs from the First Nu-ya-kuk Lake up the TikChik River and that from this run they take most of their winters supply of fish.

When our examination of the TikChik District had been completed and the return made to Snag Point September 17, the writer rejoined the operations at Aleknagik Lake September 18, where work was continued until October 1, when equipment and boats were taken to Snag Point and stored for the winter. During the late fall a native living at Snake River Lake which is drained into the estuary of Nushagak Bay by Snake River reported that an immense run of red salmon entered the lake during the last season (1923). A trip was contemplated to this lake, but was made impossible by unfavorable weather conditions and the lateness of the season.

Respectfully,

(Signed) A. T. Looff
Warden.